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(54) Abstract Title
Message display terminal

(57) A communications system (1) consists of a number of terminals including telephones and facsimile machines connected to local exchanges of a public service telephone network (8). Each terminal (2) is connected to the local exchange by a signal line (4) but also receives broadcast information via an antenna (12) from a message control centre (13) via radio waves from a radio tower (14). Each terminal is provided with a display screen (25) for displaying text and graphic information so that information of interest to the user, such as advertising material, may be broadcast. User specific requirements may be configured into the terminal in the form of a terminal address which is compared with the address of each broadcast message so that only messages having a corresponding address are processed and stored for presentation to the user. The system has use in distributing information to users of telephones and facsimile machines visually to communicate advertising messages and business information.

Fig 1

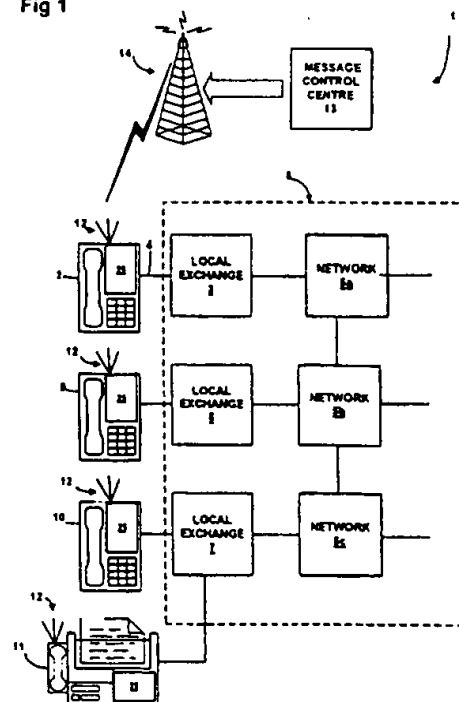


Fig 1

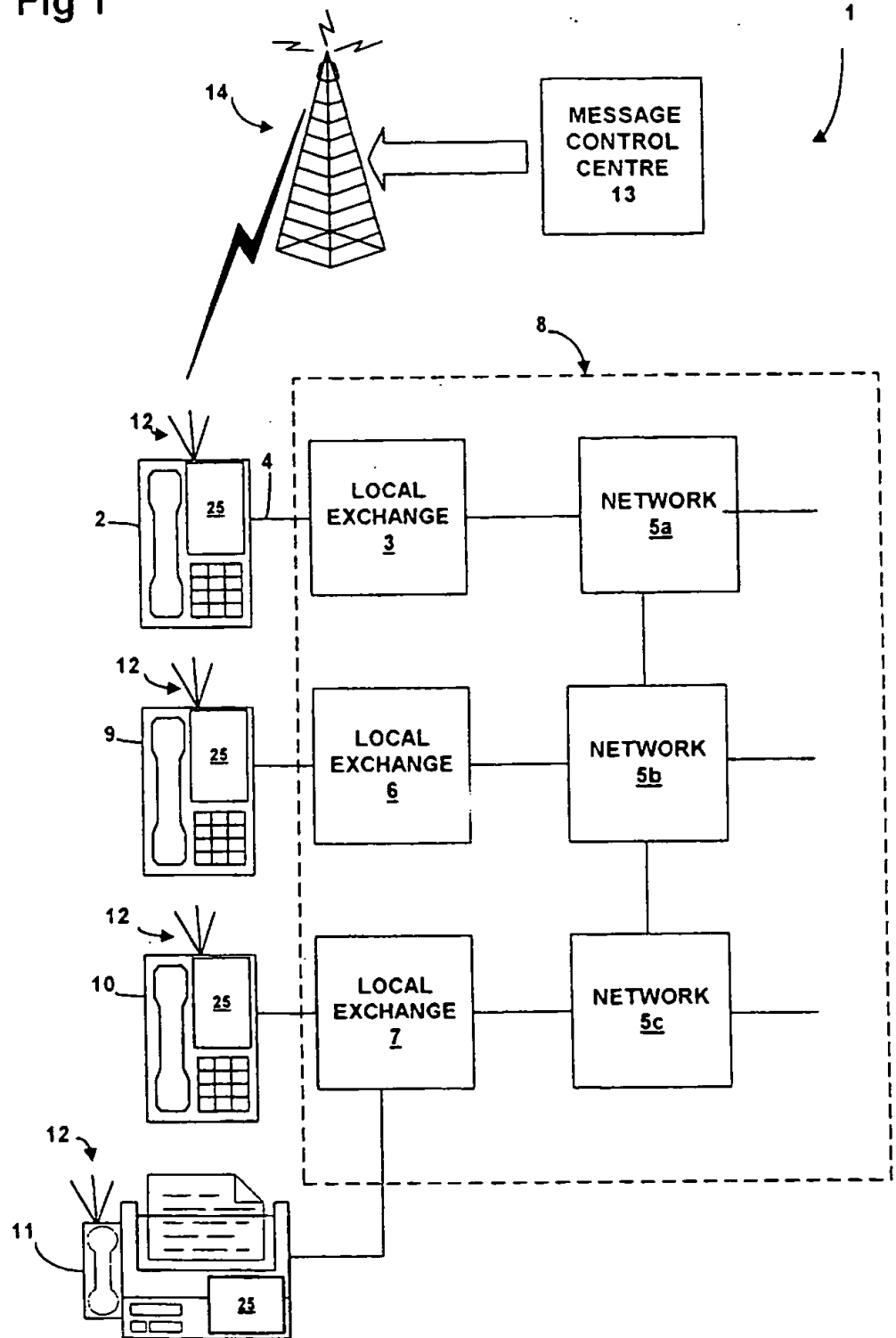


Fig 2

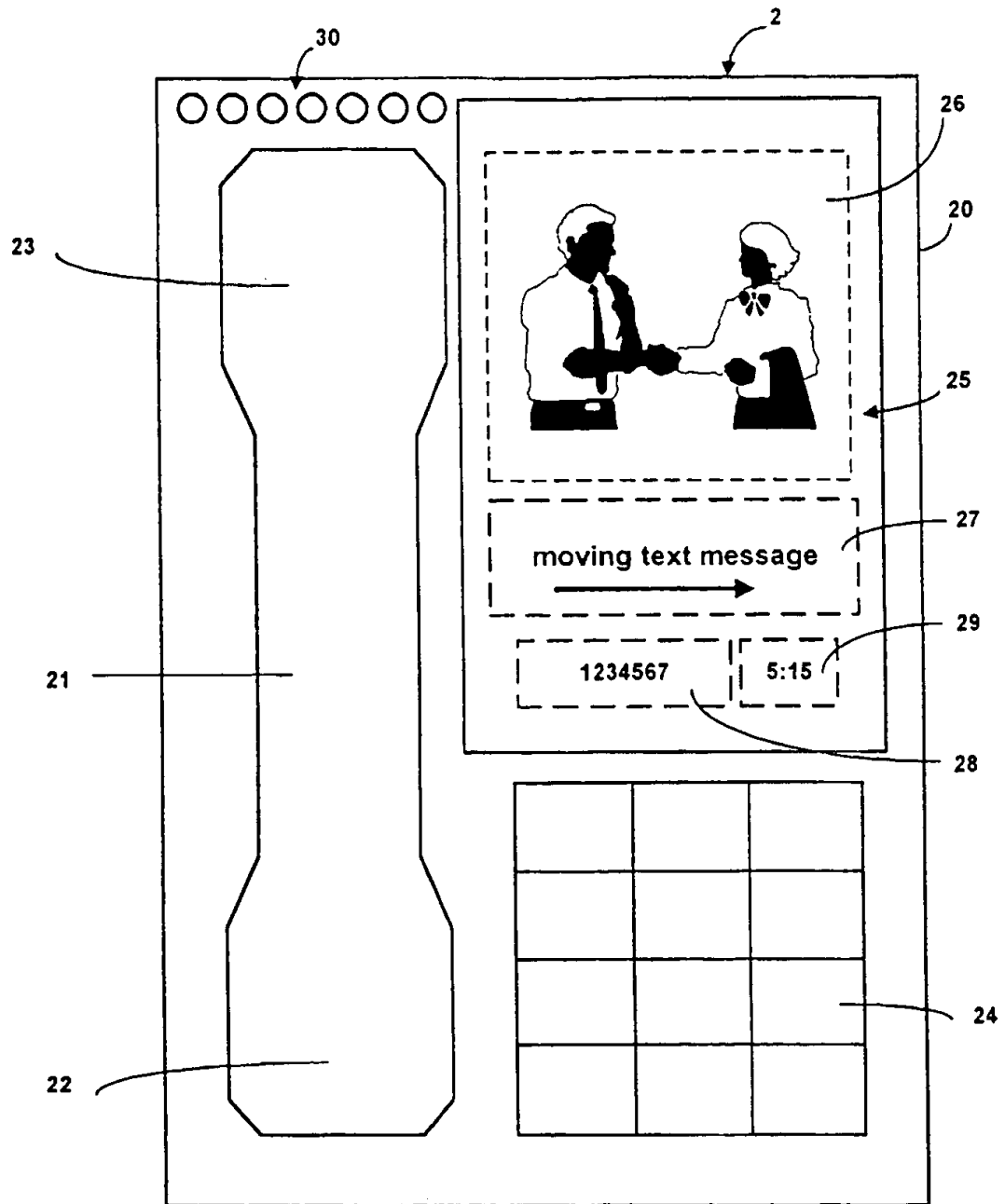


Fig 3

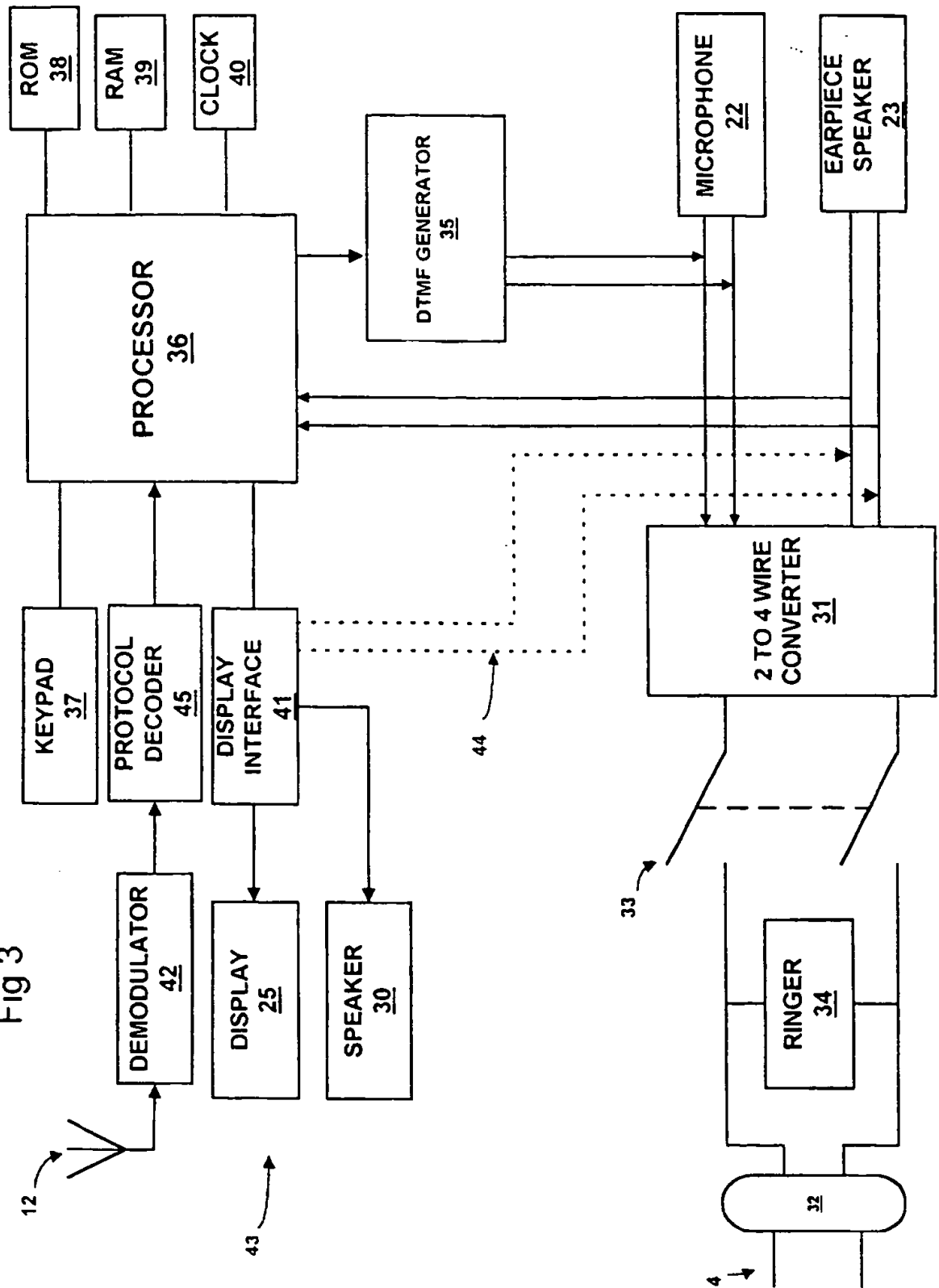


Fig 4A

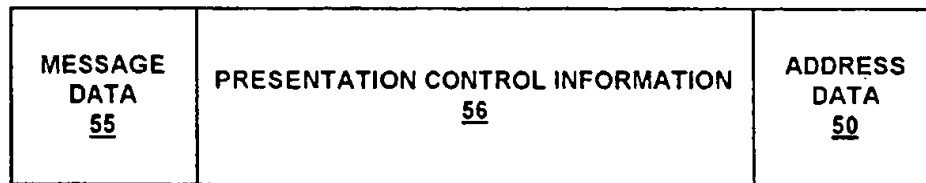


Fig 4B

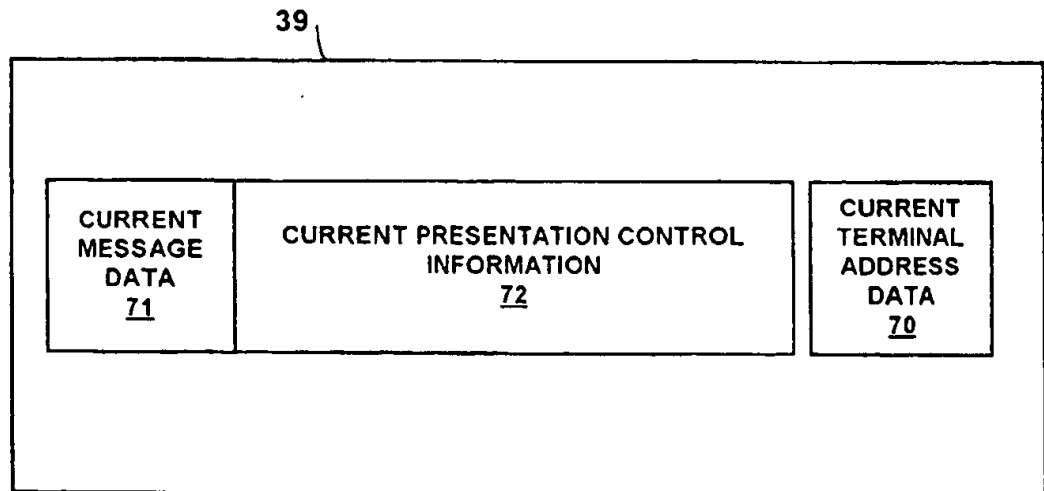


Fig 5

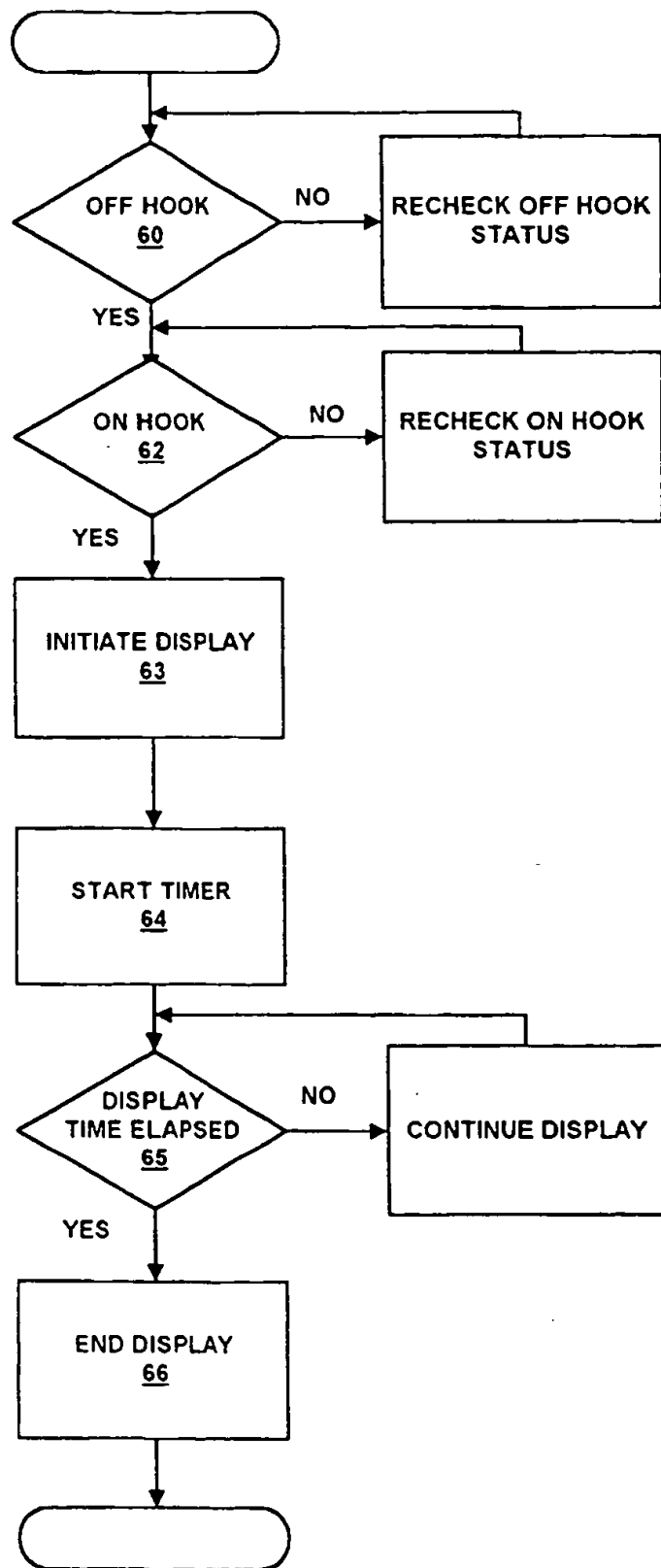
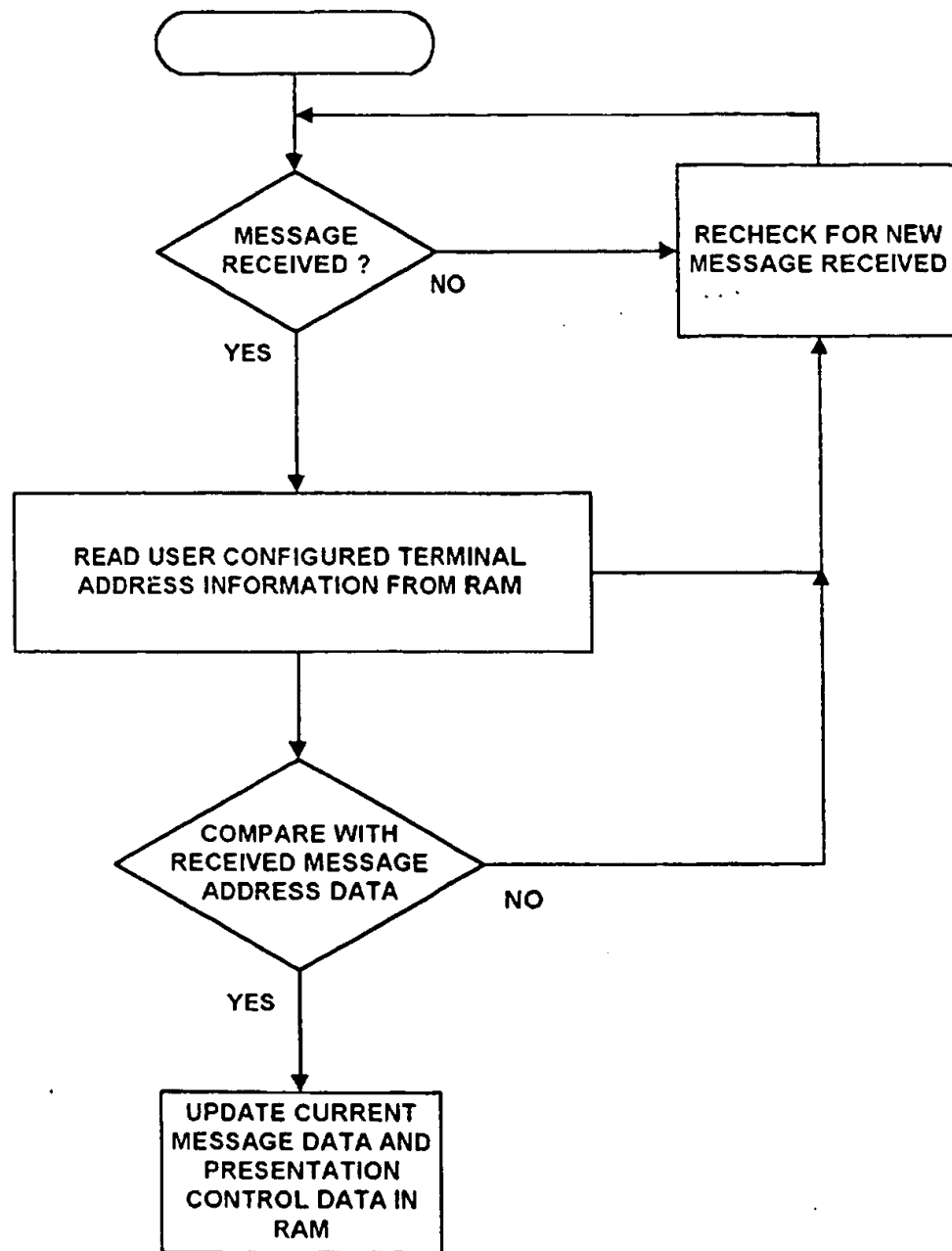


Fig 6



COMMUNICATIONS TERMINAL WITH MESSAGE DISPLAY

The present invention relates to communications terminals such as telephones of the type connected to a public service telephone network via signal lines and to such terminals having message displays.

It is known for communications terminals such as telephones and facsimile machines to be connected to signal lines of a public service telephone network by suitable wires, cables and connectors so that telephonic communications and data transmission may be routed via the network. Telephone calls originating at the communications terminal or received at the communications terminal are typically routed via a local exchange connected to one or more networks for inland or overseas calls. Typically a residence or workplace would be provided with telephone sockets into which connection is made by appropriate wiring from the communications terminal and signal lines, which may include optical fibre links, provide connection to the local exchange.

It is known for such communications terminals to be provided with a display, typically in the form of a liquid crystal display screen, driven by a processor and indicating call number information and optionally date and time information to the user of the terminal.

It is also known in a pager system for portable pager devices to receive messages from a radio pager

transmission via broadcast radio waves, typically VHF, and for a pager device to include a liquid crystal display to present a message addressed to a specific pager device or group of pager devices by a paging control centre from which messages are originated on demand by users of the pager system. Typically users contact the paging control centre by telephone and request transmission of a text message to the specified device(s).

10 It is also known to provide display systems receiving broadcast information using television sets to provide continuous updates of information such as business information relating to stock prices and advertising material.

15 It is an object of the present invention to provide an improved communications terminal having improved display facilities.

Accordingly to the present invention there is disclosed a communications terminal comprising:

20 connecting means operable to provide connection to a signal line of a public service telephone network;

communication means operable to transmit and receive communication signals via the connecting means for use in the network;

25 a receiver operable to receive broadcast electromagnetic signals carrying broadcast information; and

an information presenting system operable to present a broadcast message comprising at least one of a visible message and an audible message to a user of the communication means in accordance with the broadcast
5 information.

Preferably the information presenting system may be responsive to user actuation of the communication means so that, where for example the communication means is a telephone, the information presenting system may respond
10 to events such as initiating a telephone call or terminating a telephone call to commence presenting a message to the user of the telephone.

The broadcast message may be presented visually by means of a display screen such as a liquid crystal
15 display and may include an audible message delivered by means of a loudspeaker or by means of an earpiece of the communication means, as in the case of the earpiece of a handset of a telephone. The broadcast message may be presented both visually and audibly or may comprise a
20 solely visible message or a solely audible message.

The communications terminal preferably comprises a receiver operable to receive broadcast electromagnetic signals of the type conventionally transmitted to radio pager devices from a radio pager transmission. The
25 communications terminal preferably includes message information storing means to store received broadcast information contained in received signals, in readiness

to present the broadcast message in response to an initiating event, typically associated with user operation of the communication means.

Alternatively, the broadcast information may be
5 stored and the broadcast message continuously presented.

A communications system in accordance with the present invention is disclosed whereby message information is broadcast to communications terminals of the above disclosed type with the facility to provide
10 each terminal with the same broadcast information and optionally to address individual terminals or sets of terminals with specific broadcast information, as for example in the case of services being variably provided according to user preference. Communications terminals
15 may therefore store address information and select broadcast information only if it contains corresponding address data. The communications terminals may be configured by a user to set terminal address information according to a number of options reflecting interests of
20 the user and other user attributes such as location, age and sex so that messages, including advertising material may be targeted specifically to appropriate recipients.

Preferred embodiments of the present invention will now be described by way of example only and with
25 reference to the accompanying drawings of which:

Figure 1 is a schematic diagram of a communication system including a public service telephone network and

having communications terminals connected to the network and arranged to receive broadcast information;

Figure 2 is a schematic external plan view of a telephone in accordance with the present invention;

5 Figure 3 is a schematic diagram of the internal components of the telephone of Figure 2;

Figure 4A is a schematic diagram of the contents of a broadcast message;

10 Figure 4B is a schematic diagram of the contents of a Random Access Memory containing current message and address information;

Figure 5 is a schematic flowchart illustrating a process for presenting information; and

15 Figure 6 is a schematic flowchart illustrating a method of updating current message data and presentation control data in the Random Access Memory of the terminal.

20 Figure 1 shows a communications system 1 in which a telephone 2 is connected to local exchange 3 by means of a signal line 4. The local exchange 3 is connected to networks 5a, 5b and 5c and other local exchanges 6 and 7, together forming a public service telephone network 8.

25 Other communications terminals in the form of telephones 9 and 10 and facsimile machine 11 are similarly connected to local exchanges 6 and 7 of the public service telephone network.

The telephone 2 is provided with an antenna 12

suitable for receiving VHF signals at 153.35 MHz, this being the type of broadcast electromagnetic signals currently used by radio pager transmitters of paging systems. In accordance with the POCSAG standard the
5 transmission encoded data at 2,400 bps using FEC (Forward error coding) of ECH type and interleaving.

A message control centre 13 generates broadcast information and is connected to a radio tower 14 transmitting the broadcast electromagnetic (VHF) signals
10 to be detected by antenna 12.

Each of the further communications terminals 9, 10 and 11 is similarly provided with a respective antenna 12.

The external appearance of the telephone 2 is shown
15 in plan view in Figure 2 and consists of a base 20 to which is removably mounted a handset 21 which includes a microphone 22 and speaker 23. The handset 21 is connected to the base 20 via cable (not shown). A key pad 24 is provided for the user input of telephone
20 numbers.

A display screen 25 is mounted on the base 20 and presents a visible message consisting of a graphic portion 26 and a text portion 27. The display 25 also includes a number display area 28 in which dialled
25 telephone numbers are displayed in conventional manner and a clock display area 29 in which the time of day is indicated.

A loudspeaker 30 is also mounted in the base 20.

Figure 3 illustrates the internal structure of the telephone 2 in schematic form. The telephone 2 comprises a two wire to four wire converter 31, the input side of which is connected to a telephone socket 32 via an OFF-hook switch 33. On the telephone socket side of the OFF-hook switch 33, a ringer 34 is positioned between the two wires. The contacts of the OFF-hook switch 33 are closed when the hand set 21 shown in Figure 2 is lifted by the user, thereby creating an OFF-hook event to initiate a telephone call.

On the four wire side of the two wire to four wire converter 31, two wires are connected to the microphone 22 and a further two wires are connected to earpiece speaker 23.

A dual tone multi-frequency (DTMF) generator 35 is also connected to the two wire to four wire converter 31 in parallel with the microphone 22, the DTMF generator having its input connected to an output of a processor 36. The processor 36 is also connected to a key pad 37, a ROM 38, a RAM 39 and a clock 40.

An interface 41 has its input connected to an output of the processor 36 and has outputs driving the display screen 25 and the loudspeaker 30.

A demodulator 42 has its input connected to aerial 12. The demodulator 42 has an output connected to a protocol decoder 45 whose output is connected to an input

of the processor 36.

Operation of the telephone 2 in making a telephone call will now be described. A user initiates a telephone call by lifting the handset 21, this being detected by the OFF-hook switch 33 which connects the two wire to four wire converter 31 to the telephone socket 32 and provides an OFF-hook signal to processor 36. On hearing a dial tone via the earpiece speaker 23, the user then inputs the telephone number of the destination telephone to be called using the key pad 37 which sends the numerical data defining the call number to the processor 36. The processor actuates the DTMF generator which outputs dial tone signals transmitted via the two to four wire converter 31 to the telephone socket 32 for outgoing transmission via the signal line 4. A call is terminated by replacing the handset 21, this being detected by means of the OFF-hook switch 33. The message control centre 13 transmits the broadcast signals in which the encoded broadcast information has contents as illustrated schematically in Figure 4A. An address block 50 contains address data which determines whether the telephone 2 is the intended recipient of the message. A presentation control information block 56 contains presentation control information defining the manner in which message data contained in a message data block 55 is presented.

The telephone stores terminal address information 70 in RAM 39 and processes only broadcast information

containing corresponding address data. When a broadcast message is received, the message data 55, presentation control information 56 and address data 50 are temporarily stored in a buffer memory and the address data compared with the terminal address information. If there is correspondence between the address data 50 and the terminal address information 70, the stored current message data 71 and current presentation control information 72 stored in the RAM 39 are updated to correspond to the received broadcast message. If there is no correspondence between the terminal address information 70 and the address data 50 then the current message data and current presentation control information are not updated and remain unchanged.

Figure 4B illustrates schematically the storage in RAM 39 of the current message data 71, current presentation control information 72 and current terminal address data 70. The user may configure operation of the telephone by setting the current terminal address data 70 to any one of a set of available addresses which may for example be comprised of a number of fields indicating leisure interests, professional activities, age and sex of the user so that the user may configure the telephone to present only those messages likely to be of interest.

The telephone therefore presents messages in accordance with the current message data 71 and current presentation control information 72, these being updated

periodically whenever a broadcast message having the appropriate address data 50 is received. The telephone may be reconfigured at any time by the user inputting an appropriate command code via the keypad 24 and during
5 this configuration mode the processor 36 may control the display screen 25 to present a menu of options to the user for selection via appropriate input using the keypad 24.

The current presentation control information 72
10 contains an identifier indicating the nature of the message as being text, audio, video, animated graphic. The current presentation control information 72 may also include a display application (the term "display application" is here used to indicate a program or
15 application such as a Java Applet which may be downloaded to the telephone processor to process message data 71 and determine for example a scrolling pattern or image movement to be used in visual displays). Typically, the display application may be changed periodically to
20 present each set of message data in a corresponding new style.

The presentation control information block 72 also contains information determining the timing of display of presenting a message such as for example the following
25 options:

- Option 1: display the message when received in real time from the pager message control centre and

continue to display until a further message received;

- Option 2: receive and store the message information and display the message for a predetermined time interval initiated in response to an OFF-hook event when the user initiates a telephone call by lifting the handset;
- Option 3: receive and store the message information and initiate the presentation of the message in response to an ON-hook event when a user terminates a telephone call by replacing the handset.

The presentation control information block 72 also contains information determining the time interval during which the message is to be displayed in options 2 and 3 above.

The current message data block 71 contains data relating to the information content of message to be presented by the information presenting system 43 constituted by the display 25, speaker 30, display interface 41, processor 36 and RAM 39 of Figure 3.

Existing paging systems are adapted to transmit alphanumeric messages of a maximum of 240 characters. This may be sufficient for simple text messages to be displayed in an embodiment of the present invention by the information presenting system 43 where for example a moving text message is presented in text portion 27. Longer messages may however be transmitted for storage

in the RAM 39 by dividing the message content into a number of portions and forwarding the portions in separate consecutive pager transmissions.

Examples of information to be presented by the
5 information presenting system 43 will now be described.
An advertising message may be presented as text in the text portion 27 which may be expanded to fill the entire display screen 25. The text message may be scrolled from side to side or up and down during the period for which
10 the message is displayed. The content of the advertising information may for example be to publicise a special offer on telephone calls or current call charges such as "Pathfinder now offers peak time call charges to the United States for 13 pence per minute". As referred to
15 above, the current message is tailored to the requirements of the user, as determined by the configuration of the terminal address information, so that advertising messages can be targeted to appropriate recipients. Other text messages may for example contain
20 trading prices on the stock market presented in the form of a Stock Ticker or other commercial information of specific interest to the user such as sports results.

A second example of presenting information by the information presenting system 43 is to display an
25 animated graphic image in the graphic portion 26 of display 25. If it is not required to simultaneously display text then the graphic portion may expand to fill

the whole display. The graphic display may include text or have a separate text portion 27 as shown in Figure 2.

The graphic display may represent an advertising logo or display other visual graphic information such as
5 a weather chart, or road map.

In a third example, the visual display is not required and an audible message is presented via the speaker 30. The message may be encoded in a compact form suitable for driving a speech synthesiser contained in
10 the interface 41. The audible message may include music.

A fourth example is an audible message delivered via the earpiece speaker 23, requiring connection between the display interface 41 and the two wires connected to the earpiece speaker 23, this connection being illustrated
15 by connecting wires 44 in Figure 3 which are shown as broken lines representing that this is an alternative option. The visible display 25 may optionally be also connected to the display interface 41 in this example to display text corresponding to the synthesised speech
20 delivered to the earpiece speaker 23.

A procedure for controlling the elapsed time of a display and the time at which the display is initiated is illustrated in Figure 5. It is to be understood that in referring to "display" any of the above examples of
25 presenting a message are to be included as possible alternatives.

In Figure 5 the processor 36 checks at step 60

whether the telephone is in an OFF-hook state, as detected by the OFF-hook switch 33. If the OFF-hook state is detected, the processor checks for any change in status to the ON-hook state. When the ON-hook state is detected at step 62, the display is initiated and a timer started. The elapsed time is measured by means of clock 40 and when the elapsed time has reached a predetermined time interval as determined at step 65, the display is ended at step 66.

10 A number of alternative embodiments in accordance with the present invention and within the scope of the appended claims are envisaged. For example the display screen may comprise a colour liquid crystal display to enhance the appearance of text, video or animated
15 graphics. The display screen optionally may comprise a segmented alphanumeric display.

 The handset 21 may be arranged to communicate by radio signal with the base 20 in known manner to avoid the need for a cable connection therebetween. The
20 telephone may alternatively comprise an integral handset as a "one piece" telephone which the OFF-hook switch was a manually actuated ON-OFF switch.

 The pager transmitter may alternatively be a satellite based system.

25 For the avoidance of doubt, it is intended that communications terminals in accordance with the present invention should be attached by wiring, cables or

equivalent physical connection to sockets of the public service telephone network and that portable cellular telephones do not fall within the intended meaning of "communications terminal" in accordance with the above
5 description and the appended claims.

CLAIMS

1. A communications terminal comprising:

connecting means operable to provide connection to
5 a signal line of a public service telephone network;

communication means operable to transmit and receive
communication signals via the connecting means for use
in the network;

a receiver operable to receive broadcast
10 electromagnetic signals carrying broadcast information;
and

an information presenting system operable to present
a broadcast message comprising at least one of a visible
message and an audible message to a user of the
15 communication means in accordance with the broadcast
information.

2. A communications terminal as claimed in claim 1,
wherein the information presenting system is responsive
20 to user actuation of the communication means to initiate
the presentation of the broadcast message.

3. A communications terminal as claimed in claim 2,
wherein the information presenting system is operable to
25 initiate presentation of the broadcast message in
response to detection of the termination of a telephone
call by the communication means.

4. A communications terminal as claimed in claim 3,
comprising a clock and wherein the information presenting
system is operable to end presentation of the broadcast
message when elapsed time measured by the clock since
5 initiation of the presentation is equal to a
predetermined period.

5. A communications terminal as claimed in claim 2,
wherein the information presenting system is operable to
10 initiate presentation of the broadcast message in
response to detecting the commencement of a telephone
call by the communication means.

6. A communications terminal as claimed in any
15 preceding claim, wherein the receiver is operable to
receive signals transmitted by a radio pager transmitter.

7. A communications terminal as claimed in any
preceding claim, wherein the receiver comprises an
20 antenna mounted internally of the communications means.

8. A communications terminal as claimed in any
preceding claim, comprising message information storing
means operable to store broadcast information.

25

9. A communications terminal as claimed in claim 8,

wherein the message information storing means is operable to replace stored broadcast information with newly received broadcast information whereby the broadcast message presented by the information presenting system
5 corresponds to the latest received broadcast information.

10. A communications terminal as claimed in claim 9, comprising address storing means operable to store address information associated with the communications
10 terminal;

comprising means operable to compare address data contained in the broadcast information with the address information; and

selecting means operable to select only broadcast
15 information for which the address data corresponds to stored address information for replacing the stored broadcast information.

11. A communications terminal as claimed in claim 10
20 comprising configuring means operable to configure the address information stored in the terminal in accordance with any one of a set of addresses corresponding to respective types of broadcast message whereby a user may selectively receive a selected one or more of said types
25 of broadcast message.

12. A communications terminal as claimed in claim 11 wherein the configuring means comprises a keypad of the terminal operable to input configuring data to the address storing means.

5

13. A communications terminal as claimed in any preceding claim, wherein the message information storing means is operable to store broadcast information comprising message data defining the information content
10 of the message to be presented and presentation control information defining the manner in which the message data is presented, the information presenting system being further operable to selectively present the broadcast message based on the message data in any one of a
15 plurality of modes in dependence upon the presentation control data.

14. A communications terminal as claimed in claim 13, wherein the message information storing means is operable
20 to store message data comprising at least one of alphanumeric data, speech synthesis data, video data, graphic data and graphic animation data.

15. A communications terminal as claimed in claim 14,
25 wherein the message information storing means is operable to store presentation control data determining the timing

at which message presentation commences and the duration of presentation.

16. A communications terminal as claimed in claim 13,
5 wherein the message information storing means is operable to store presentation control data defining the manner in which alphanumeric data is scrolled.

17. A communications terminal as claimed in claim 13,
10 wherein the presentation control information comprises a computer program for processing the message data.

18. A communications terminal as claimed in any preceding claim, wherein the information presenting
15 system comprises a display screen.

19. A communications terminal as claimed in any preceding claim, wherein the information presenting system comprises a loudspeaker.

20

20. A communications terminal as claimed in any preceding claim, wherein the communication means comprises a telephone.

25 21. A communications terminal as claimed in claim 20, wherein the information presenting system is operable to

present an audible message via an earpiece speaker of the telephone.

22. A communications terminal as claimed in any of
5 claims 1 to 19, wherein the communication means comprises a facsimile machine.

23. A method of operating a communications terminal comprising the steps of:

10 provide connection of the communications terminal to a signal line of a public service telephone network;
operating a communication means of the communications terminal to transmit and receive communication signals via connection to the signal line
15 in use of the network;

receiving broadcast electromagnetic signals carrying broadcast information; and

operating an information presenting system to present a broadcast message comprising at least one of
20 a visible message and an audible message to a user of the communication means in accordance with the broadcast information.

24. A method as claimed in claim 23, wherein the
25 information presenting system responds to user actuation of the communication means to initiate the presentation

of the broadcast message.

25. A method as claimed in claim 24, wherein the information presenting system initiates presentation of the broadcast message in response to detection of the termination of a telephone call by the communication means.

26. A method as claimed in claim 25, wherein the information presenting system ends presentation of the broadcast message when elapsed time measured by a clock since initiation of the presentation is equal to a predetermined period.

27. A method as claimed in claim 24, wherein the information presenting system initiates presentation of the broadcast message in response to detecting the commencement of a telephone call by the communication means.

20

28. A method as claimed in any of claims 23 to 27, wherein the signals are transmitted by a radio pager transmitter.

29. A method as claimed in any of claims 23 to 28, including the step of storing broadcast information.

30. A method as claimed in claim 29, including the step of replacing stored broadcast information with newly received broadcast information whereby the broadcast message presented by the information presenting system
5 corresponds to the latest received broadcast information.

31. A method as claimed in claim 30, comprising storing address information associated with the communications terminal;
10 comparing address data contained in the broadcast information with the address information; and
selecting only broadcast information for which the address data corresponds to stored address information for replacing the stored broadcast information.

15
32. A method as claimed in claim 31 including the step of configuring the address information in accordance with any one of a set of addresses corresponding to respective types of broadcast message whereby a user selectively
20 receives a selected one or more of said types of broadcast message.

33. A method as claimed in claim 32 wherein the address information is configured by operation of keypad of the
25 terminal to input configuring data to the address storing means.

34. A method as claimed in any of claims 23 to 31, including the step of storing broadcast information comprising message data defining the information content of the message to be presented and presentation control
5 information defining the manner in which the message data is presented, the information presenting system selectively presenting the broadcast message based on the message data in any one of a plurality of modes in dependence upon the presentation control data.

10

35. A method as claimed in claim 34, including the step of storing message data comprising at least one of alphanumeric data, speech synthesis data, video data, graphic data and graphic animation data.

15

36. A method as claimed in claim 35, including the step of storing presentation control data determining the timing at which message presentation commences and the duration of presentation.

20

37. A method as claimed in claim 34, including the step of storing presentation control data defining the manner in which alphanumeric data is scrolled.

25 38. A method as claimed in claim 34, wherein the presentation control information comprises a computer

program and including the step of processing the message data in accordance with the computer program.

39. A method as claimed in any of claims 23 to 38,
5 wherein the information presenting system presents a broadcast message on a display screen.

40. A method as claimed in any of claims 23 to 39,
10 wherein the information presenting system presents the broadcast message via a loudspeaker.

41. A method as claimed in any of claims 23 to 40,
wherein the communication means comprises a telephone.

15 42. A method as claimed in claim 41, wherein the information presenting system presents an audible message via an earpiece speaker of the telephone.

43. A method as claimed in any of claims 23 to 40,
20 wherein the communication means comprises a facsimile machine.

44. A communication system comprising a public service telephone network;
25 a set of communications terminals connected to signal lines of the network;

a broadcast system operable to broadcast electromagnetic signals containing message information; and wherein each of the set of communications terminals comprises a respective receiver operable to receive the broadcast signals and a respective information presenting system operable to present a broadcast message to a user of the communications terminal in accordance with the broadcast message information.

10 45. A communications terminal substantially as hereinbefore described with reference to and as shown in any of the accompanying drawings.

46. A method of operating a communications terminal
15 substantially as hereinbefore described with reference to and as shown in any of the accompanying drawings.

47. A communications system substantially as hereinbefore described with reference to and as shown in
20 any of the accompanying drawings.



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Claims searched: All

Examiner: AL STRAYTON
Date of search: 25 August 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.P): H4K: KBHX; KFH; KOD2

Int CI (Ed.6): H04M, H04N

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	NONE	

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Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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